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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,797	10/16/2003	Sung-Hoon Lee	030681-575	5138
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EXAMINER				
BELL, BRUCE F				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
06/05/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

### Office Action Summary

**Application No.**

10/685,797

**Applicant(s)**

LEE ET AL.

**Examiner**

Bruce F. Bell

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4, 13, 15-17, 22-25 and 28-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16, 17, 24, 25 and 28-31 is/are allowed.
- 6) ☒ Claim(s) 4, 13, 15, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 4, 13, 22, 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Vanderspurt (4127508).

Vanderspurt discloses a silver cadmium alloy on a carrier substrate. The carrier substrate is selected from silica, Celite, diatomaceous earth, kieselguhr, alumina, silica-alumina, titanium oxide, pumice, carborundum and boria. The silver cadmium alloy is preferred to be supported on a carrier of silica and/or alumina. The carrier substrate component of the catalyst composition can be incorporated during the catalyst preparation by slurring the finely divided carrier substrate mass in the aqueous medium immediately after the silver cadmium hydroxides are precipitated. Finely divided porous material such as fumed silica or diatomaceous earth are highly preferred carrier substrate materials. See col. 2, lines 23-51. The silver and cadmium in the catalyst must be substantially in the form of an alloy. See col. 3, lines 11-13. The silver cadmium alloy catalyst are most effective when supported on a carrier substrate. Catalyst that are prepared with out a carrier substrate have been found to have a lower activity and shorter catalyst life than the corresponding supported catalyst. Typical carrier substrate will have an initial surface area of more than about 1-10 m<sup>2</sup>/gm and an

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average pore diameter greater than about 20 Å. A high proportion of small pores is detrimental to catalyst activity, if the size of the pores are such that capillary condensation occurs and causes pore blockage, which results in loss of catalytic activity. See col. 4, lines 52-66. The desired catalyst can be achieved by calculating the quantity of silver and cadmium complexes or salts needed in solution that are introduced into the pores of the carrier substrate. See col. 4, line 67 – col. 5, line 2. Example 13 shows that copper can also be included in the Ag-Cd catalyst composition.

The prior art of Vanderspurt anticipates the applicants instant invention as set forth in the instant claims as presented as shown above with respect to the disclosure.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 4, 13, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Vanderspurt (4072727).

Vanderspurt discloses a silver cadmium alloy on a carrier substrate. The carrier substrate is selected from silica, Celite, diatomaceous earth, kieselguhr, alumina, silica-alumina, titanium oxide, pumice, carborundum and boria. The silver cadmium alloy is preferred to be supported on a carrier of silica and/or alumina. The carrier substrate component of the catalyst composition can be incorporated during the catalyst preparation by slurring the finely divided carrier substrate mass in the aqueous

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medium immediately after the silver cadmium hydroxides are precipitated. Finely divided porous material such as fumed silica or diatomaceous earth are highly preferred carrier substrate materials. See col. 2, lines 23-51. The silver and cadmium in the catalyst must be substantially in the form of an alloy. See col. 3, lines 16-18. The silver cadmium zinc alloy catalyst are most effective when supported on a carrier substrate. Catalyst that are prepared with out a carrier substrate have been found to have a lower activity and shorter catalyst life than the corresponding supported catalyst. Typical carrier substrate will have an initial surface area of more than about  $1\text{-}10\text{ m}^2/\text{gm}$  and an average pore diameter greater than about  $20\text{ \AA}$ . A high proportion of small pores is detrimental to catalyst activity, if the size of the pores are such that capillary condensation occurs and causes pore blockage, which results in loss of catalytic activity. See col. 4, lines 32-46. The desired catalyst can be achieved by calculating the quantity of silver and cadmium complexes or salts needed in solution that are introduced into the pores of the carrier substrate. See col. 4, lines 47-50.

The prior art of Vanderspurt anticipates the applicants instant invention as set forth in the instant claims as presented as shown above with respect to the disclosure.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vanderspurt (4072727 or 4127508) in combination with Hara et al (6111134).

Vanderspurt (4072727 or 4127508) are both taught above in the 35 USC 102(b) rejections.

Neither of the Vanderspurt patents disclose that the carrier be that of graphite , mesoporous carbon powder or carbon nanotube.

Hara et al disclose that the catalyst are supported on a carrier and impregnation, immersion, precipitation, pore filling and other methods can be used. The physical characteristics of the carrier are that it is required to be a porous material and that the average pore diameter is over 3nm but no more than 50 nm. See col. 4, line 57 – col.5, line 3. Examples of porous carriers are those of carbon carriers such as activated carbon and graphite, metal oxide carriers such as silica, alumina, titania, zirconia, and mixtures of these oxides.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though the prior art of Vanderspurt does not teach the carbon materials, the prior art of Hara et al shows that these material as conventional to be used with catalyst materials and can be used interchangeably as is known to be done, as shown in the Hara et al patent. Therefore, the prior arts of either Vanderspurt patent in combination with Hara et al renders the applicants instant claims as obvious.

***Allowable Subject Matter***

7. Claims 16, 17, 24, 25, 28-31 are allowable over the prior art of record.

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8. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach and/or suggest the use of the catalyst alloy formed within the pores of the porous carrier having an alloy composition of cadmium with either gold, silver, copper, nickel or platinum. Even though catalyst of CdAg and CdCu and Cd Au and CdNi are known, it is not known to used these catalyst in a direct methanol fuel cell.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 571-272-1296. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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BFB

May 30, 2008

/Bruce F. Bell/

Primary Examiner, Art Unit 1795